

## **SIMULTANEOUS BI-DIRECTIONAL SIGNAL TRANSMISSION SYSTEM AND SEMICONDUCTOR DEVICE THEREFOR**

### Abstract of the Disclosure

A simultaneous bi-directional signal transmission system includes a first semiconductor device, a second semiconductor device, and one or more transmission lines. The first semiconductor device includes a first output MUX which receives first binary data and converts the first binary data into a first signal having one of at least four levels; a first transmitter which is connected to the first output MUX and outputs the first signal via the transmission line to the second semiconductor device; a first receiver which compares one or more reference voltages selected by the first signal with a third signal input via the transmission line and outputs the comparison result; and a first input encoder which detects the second binary data based on the comparison result output from the first receiver. The second semiconductor device includes a second output MUX which receives second binary data and converts the second binary data into a second signal having one of at least four levels; a second transmitter which is connected to the second output MUX and outputs the second signal via the transmission line to the first semiconductor device; a second receiver which compares one or more reference voltages selected by the second signal with the third signal input via the transmission line and outputs the comparison result; and a second input encoder which detects the first binary data based on the comparison result output from the second receiver.

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